



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,571	01/07/2002	Abdol Hamid Aghvami	34576-PCT-USA	2923
7590		01/24/2006	EXAMINER	
Baker Botts		DSOUZA, JOSEPH FRANCIS A		
30 Rockefeller Plaza				
New York, NY 10112-0228		ART UNIT		
		2637		
		PAPER NUMBER		

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/913,571	AGHVAMI ET AL.	
	Examiner	Art Unit	
	Adolf DSouza	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 9-17 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/13/2001</u> . | 6) <input type="checkbox"/> Other: _____ |

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Drawings

2. The drawings are objected to because Figs. 2 - 5 are too small to clearly show the differences between the various bit error rate curves. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

On page 4, lines 20-21, reference are made to "two places" numbered 1 and 2. These are not shown in any of the drawings.

It is not clear what parameter is shown in Table 1 on page 5.

Appropriate correction is required.

Claim Objections

4. Claim 18 is objected to because of the following informalities:

Claim 18 states "L-P-S is applied ...". In view of the specification, this is interpreted as "K-P-S".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 12-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Art Unit: 2637

On page 5, lines 5-10 state "... the cross correlations between the cancelled and the remaining users can be cancelled from the matched filter outputs". The location of the matched filter is neither described anywhere in the specification nor is it shown in any of the drawings. How the cross correlations are cancelled is not adequately described in the specification.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 9-11,14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al. (A hybrid interference canceller in CDMA, IEEE Proceedings, Volume 1, 2-4 Sept. 1998, pages 150 – 154) in view of Kim et al. (Adaptive hybrid serial/parallel interference cancellation in CDMA systems, IEEE International Conference on Universal Personal Communications, 29 Sept.-2 Oct. 1996, pages 341 - 344).

Regarding claim 1, Sun discloses a method for reducing interference between users of a carrier signal (page 151, section III, 2nd paragraph; Fig. 2); in which first the higher bit rate users have their interference reduced by hybrid interference cancellation (HIC) (page 151, section III, 2nd paragraph; wherein the high bit rate users is interpreted as one of the groups and the HIC is interpreted as the parallel detection);

and then the interference between the other lower bit rate users reduced by HIC (page 151, section III, 2nd paragraph; wherein the low bit rate users is interpreted as another one of the groups and the HIC is interpreted as the serial interference cancellation).

Sun does not disclose users with a high and low bit rate.

In the same field of endeavor, however, Kim discloses a CDMA system utilizing hybrid interference cancellation wherein there are users with a high bit rate and users with a lower bit rate (page 343, left column, lines 7-15; wherein the high bit rate users and low bit rate users are interpreted as the strongest users and remaining users respectively).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method of ranking users according to power and therefore bit rate, as taught by Kim, in the system of Sun because this would allow different interference rejection methods to be used on the received signal, thereby reducing the system complexity and improving the bit error rate.

Regarding claim 9, Sun discloses a different HIC configuration is used for the higher bit rate users and lower bit rate users (page 151, section III, 2nd paragraph; wherein the configuration that is used for higher bit rate users is interpreted as the parallel detection scheme and the HIC configuration that is used for the lower bit rate users is interpreted as the serial cancellation scheme).

All other limitations of claim 9 are as similarly analyzed as in claim 1.

Regarding claim 10, Sun doesn't show that the signals selected for OIC are the most reliable users.

In the same field of endeavor, however, Kim discloses the signals selected for partial PIC are the most reliable users as herein defined (page 342, right column, 2nd paragraph; page 343, left column, lines 7-15; wherein the partial PIC is interpreted as the multistage cancellation and the most reliable users are interpreted as the users with the strongest power).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method of parallel interference cancellation, as taught by Kim, in the system of Sun because this would allow parallel interference cancellation to be used for users where the signal power is strong, thereby reducing the delay time.

Regarding claim 11, Sun discloses the regenerated signals are cancelled from received signals at the baseband (Fig.1; page 151, section III, 2nd paragraph; wherein the regenerated signals cancelled from the signal at baseband is interpreted as the estimated MAI being subtracted from the received signal).

All limitations of claim 14-16 are contained in claim 1 and therefore claims 14-16 are similarly analyzed as claim 1.

Regarding claim 17, Sun discloses the number of users is $K = H + L$, where H is the number of high bit rate users and L is the number of low bit rate users (page 151, section III, 2nd paragraph; wherein the number of users H+L is interpreted as the number of users in the 1st and 2nd groups when the number of groups is 2) wherein an HIC with the best BER among HIC configurations is used to cancel the signals of the high bit rate users (page 151, section III, 2nd paragraph; wherein the HIC that is used to cancel signals of the high bit rate users is interpreted as the parallel detection scheme used), and HIC is then applied to cancel the interference among the low bit rate users (page 151, section III, 2nd paragraph; wherein the HIC that is applied to cancel the interference among low bit rate users is interpreted as the serial cancellation scheme).

9. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al. (A hybrid interference canceller in CDMA, IEEE Proceedings, Volume 1, 2-4 Sept. 1998, pages 150 – 154) in view of Kim et al. (Adaptive hybrid serial/parallel interference cancellation in CDMA systems, IEEE International Conference on Universal Personal Communications, 29 Sept.-2 Oct. 1996, pages 341 - 344) and further in view of Patel (Analysis of a DS/CDMA successive interference cancellation scheme using correlations, GLOBECOM '93, IEEE, 29 Nov.-2 Dec. 1993, pages 76 - 80).

Regarding claim 12, Sun does not disclose cross correlations are used.

In the same field of endeavor, however, Patel discloses the cross correlations between the cancelled and the remaining users are cancelled from matched filter outputs. (page 76, left column, last paragraph; page 77, left column, 2nd paragraph; Fig. 2).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method of using cross correlations, as taught by Patel, in the system of Sun because this would allow the regenerated signal to be cancelled from the matched filter output, thereby reducing the system complexity.

Claim 13 is similarly analyzed as claim 11.

Allowable Subject Matter

10. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Other Prior Art Cited

Art Unit: 2637

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

The following patents are cited to further show the state of the art with respect to interference cancellation in CDMA receivers:

Dent (US 5,218,619) discloses a subtractive demodulation technique for CDMA systems.

Divsalar et al. (US 5,644,592) discloses a parallel interference cancellation scheme for CDMA applications.

Schilling et al. (US 5,719,852) discloses Spread spectrum CDMA subtractive interference canceller system

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adolf DSouza whose telephone number is 571-272-1043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2637

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AD

Adolf DSouza
Examiner
Art Unit 2637



JAY K. PATEL
SUPERVISORY PATENT EXAMINER